

Health Consultation

Beacon Battery
Custer, Whatcom County, Washington

June 28, 2001

Revised contact information September 19, 2003

Prepared by
The Washington State Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry



Foreword

The Washington State Department of Health (DOH) has prepared this health consultation in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR is part of the U.S. Department of Health and Human Services and is the principal federal public health agency responsible for health issues related to hazardous waste. This health consultation was prepared in accordance with methodologies and guidelines developed by ATSDR.

The purpose of this health consultation is to identify and prevent harmful human health effects resulting from exposure to hazardous substances in the environment. The health consultation allows DOH to respond quickly to a request from concerned residents for health information on hazardous substances. It provides advice on specific public health issues. DOH evaluates sampling data collected from a hazardous waste site, determines whether exposures have occurred or could occur, reports any potential harmful effects, and recommends actions to protect public health.

For additional information or questions regarding DOH, ATSDR or the contents of this health consultation, please call the Health Advisor who prepared this document:

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Glossary

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| Agency for Toxic Substances and Disease Registry (ATSDR) | The principal federal public health agency involved with hazardous waste issues, responsible for preventing or reducing the harmful effects of exposure to hazardous substances on human health and quality of life. ATSDR is part of the U.S. Department of Health and Human Services. |
| Contaminant | Any chemical that exists in the environment or living organisms that is not normally found there. |
| Exposure | Contact with a chemical by swallowing, by breathing, or by direct contact (such as through the skin or eyes). Exposure may be short term (acute) or long term (chronic). |
| Groundwater | Water found underground that fills pores between materials such as sand, soil, or gravel. In aquifers, groundwater often occurs in quantities where it can be used for drinking water, irrigation, and other purposes. |
| Hazardous substance | Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive. |
| No public health hazard | Hazardous waste sites that do not pose a public health hazard in which there is no evidence of a current or past human exposure to contaminated media, future exposures to contaminated media are not likely to occur, and there are no community-specific health outcome data to indicate that the site has had an adverse impact on human health. |
| Exposure pathway | The way in which a person may contact a chemical substance that includes ingestion, skin contact and breathing. |

Background and Statement of Issues

The Washington State Department of Health (DOH) has prepared this health consultation at the request of the Whatcom County Health and Human Services Department (WCHHS) to evaluate the potential human health risks associated with lead contamination in soil near a battery recycling business. WCHHS has been investigating this facility as part of their Site Hazardous Assessment program.

Beacon Battery is a small home business located at 8666 Delta Line Road, Custer, Washington, in northwest Whatcom County (Figure 1). Beacon Battery receives used batteries for recycle and resale.¹ The facility is located in a relatively flat rural/agricultural area.

In November of 1990, Department of Ecology (Ecology) performed an initial investigation following a complaint of leaking batteries and improper outside storage at Beacon Battery.² The site inspection revealed that approximately 200 batteries were being stacked outside in an open area with evidence of spillage of battery acid. Soil samples near the battery storage area indicated lead contamination ranging from 2 ppm to 29,600 ppm (Figure 2). In 1993, structural changes were added to the facility, including a building with a sloped concrete floor and wastewater conveyance trench, a spill containment curb, a 1,000-gallon polyurethane tank for wastewater collection, and a covered plastic tote for batteries that are dropped off after-hours.¹

WCHHS performed another inspection in October of 1999, in which soil samples showed lead contamination ranging from 21 to 425 ppm.² During the investigation, there were no signs of acid spills (including stressed vegetation) or mishandling of hazardous materials.

Beacon Battery's on-site drinking water well is located approximately 50 feet to the west of the battery storage area (Figure 2). WCHHS sampled drinking water in October of 1999 at the residence, and found a concentration of lead at 0.002 ppm (2 ppb). The nearest neighboring domestic well is located approximately 500 feet to the east.

A site visit was performed on September 22, 2000, by the Department of Health.³ The entire facility was under cover, clean, organized, and all batteries were arranged in an orderly manner. One of the site owners, who is also a resident, stated that their drinking water has been tested and found to be safe. In addition, the owner stated that the soil contaminated with lead from 10 years ago (of 29,600 ppm) was removed; however, there are no transport or disposal records for this event. During the site visit, it was observed that this same area is now covered with asphalt.

Discussion

It is important to identify and evaluate possible exposure pathways. An exposure pathway is the process by which an individual is exposed to contaminants that originate from a source of contamination. An exposure pathway consists of the following five elements: A source of contamination, an environmental media and transport mechanism, a point-of-exposure, a route of exposure, and a receptor population. An exposure pathway must include all five elements in order to link a contaminant source to a receptor population. Exposure pathways may occur in the form of inhalation, ingestion, or dermal absorption.

A potential exposure pathway at Beacon Battery is ingestion of lead from the on-site drinking water well. EPA has set an action level of 15 ppb in drinking water for lead. The highest concentration of lead in the on-site drinking water well was 2 ppb. This concentration of lead is not expected to cause adverse short- or long-term health effects.

Another potential pathway is ingestion or dermal contact of lead in soil. Children between 1 and 2 years of age are the most susceptible to increased blood lead levels resulting from exposure to lead in soil. Evidence exists to indicate that health effects in young children may occur at blood lead levels as low as 6 ug/dl. The most sensitive toxic effect from lead exposure in children involves behavioral changes resulting from nervous system toxicity. Many of these behavioral changes involve impaired learning ability including decreased performance on IQ tests.⁵

The most recent soil sampling by WCHHS was performed in October of 1999 off the east side of the asphalt pad, and showed lead contamination ranging from 21.8 to 425 ppm, with an average of 149 ppm. The most recent soil sampling by the owner of the neighboring property was reportedly conducted in April of 1997 at approximately 30 feet north of the asphalt pad. Results showed lead contamination ranging from 454 to 3150 ppm with an average of 1686 ppm. However, there apparently was no assistance from WCHHS and no chain of custody, therefore is considered un-validated. DOH has been informed that WCHHS will be sampling this area in April of 2001 for verification.

When considering the maximum validated soil sample results, 425 ppm, EPA's Integrated Exposure Uptake Biokinetic Model (IEUBK - Version 0.99D) indicates that blood lead levels of children who play frequently in this area would not likely exceed a level of concern. ATSDR considers a blood level of 10 micrograms/deciliter (ug/dl) or greater as an indication of excessive lead exposure.^{5 6}

When considering the maximum unvalidated soil sample results, 3150 ppm, EPA's IEUBK indicates that blood lead levels of children who play frequently in this area would exceed a level of concern. DOH has been informed that WCHHS will be sampling the neighboring property in the same locations as the property owner for confirmation. Until validation has been performed, children should not frequent this area.

Exposure Pathways and Children

The potential for exposure and associated adverse health effects are often increased for young children as opposed to older children or adults. ATSDR and DOH recognize that children are susceptible to developmental toxicity that can occur at levels much lower than those causing other types of toxicity. Currently there are no young children living at the Battery Recycling facility residence; however, in the event of new residents with children, it is necessary to assess child health effects from playing in this area. The contaminated area outside the asphalt pad is not restricted and is adjacent to the owners residential yard area, therefore, the possibility exists for young children to frequent this area in the future.

Conclusions

- There is no apparent public health hazard from drinking water from the on-site domestic well at Beacon Battery.
- Based on validated soil samples, there is no worker or public health hazard from lead in soil at this facility. There is no evidence of a current or past human exposure to contaminated media other than slight lead content (2 ppb) in the owners private drinking water well. Future exposures to contaminated media outside the asphalt pad and on the neighboring property is not likely to approach a level of health concern even if young children begin to frequent the site. However, if unvalidated soil results on the neighboring property are confirmed, these levels of lead in soil would exceed a level of health concern.
- There is no community specific health outcome data to indicate that the site has had an adverse impact.

Recommendations/ Public Health Action Plan

- There are no recommendations with respect to lead in soil off the east side of the asphalt pad, however, the area 30 feet north of the asphalt pad on the neighboring property should be characterized.
 - ▶ WCHHS will be sampling the area 30 feet north of the asphalt pad for lead content, and DOH will review the results.
 - ▶ Since Beacon Battery has a history of lead contamination in soil, the on-site drinking water well should be sampled for lead on an annual basis. Results should be provided to the Department of Health.

References

1. Ecology Compliance Inspection Report, E. P. Feria, July 24, 2000.
2. Worksheet 1, Summary Score Sheet, August 29, 2000.
3. Department of Health Inspection Report, S. Matthews, November 13, 2000.
4. Ecology Site Assessment - Strategy Recommendation, May 18, 1998.
5. Toxicological Profile for Lead, US Public Health Service, ATSDR, April 1993.
6. Environmental Protection Agency, March 8, 1994, Integrated Exposure Uptake Biokinetic Model for Lead, Version 0.99D.

Certification

This Beacon Battery Health Consultation was prepared by the Washington State Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.

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The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.

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